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Academic Preschool, Champaign, Illinois; One of a Series of Successful Compensatory Education Programs. It Works: Preschool Program in Compensatory Education.

American Inst. for Research in Behavioral Sciences, Palo Alto, Calif.
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A study was conducted to test the effectiveness of a preschool program which emphasized rapid attainment of basic academic concepts. The experimentals were 4- to 5-year-old lower class, predominantly Negro, children. For 2 years they received instruction 2 hours daily, 5 times a week, in a group where the pupil-teacher ratio was five to one. To induce learning at an above-average rate, positive and negative reinforcers were used. A comparison group was pretested and posttested. After the first year of instruction, results from the Stanford-Binet showed a gain of 17.14 points for the experimental group; the comparison group showed a gain of 8.07 points. After the second year of instruction, the experimental group gained an additional 8.61 points; the comparison group lost 2.96 points. Interviews with parents and observations of the participating children revealed no behavioral problems after the second week of instruction and no regressive behavior in general. (JS)

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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IT WORKS

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IT WORKS

ACADEMIC PRESCHOOL
CHAMPAIGN, ILLINOIS

One of a Series of

Successful Compensatory Education Programs

U.S. Department of Health, Education, and Welfare
Robert H. Finch, Secretary

Office of Education
Peter P. Muirhead, Acting Commissioner

FOREWORD

This project report is part of an independent study of selected exemplary programs for the education of disadvantaged children completed by the American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif., under contract with the U.S. Office of Education.

The researchers report this project significantly improved the educational attainment of the disadvantaged children involved. Other communities, in reviewing the educational needs of the disadvantaged youngsters they serve, may wish to use this project as a model - adapting it to their specific requirements and resources.

Division of Compensatory Education
Bureau of Elementary and Secondary Education

THE ACADEMIC PRESCHOOL IN CHAMPAIGN, ILLINOIS

Introduction

The design of the academic preschool program was based on the rationale that children who are one or more years retarded in language, reading, or mathematics must learn at a rate which exceeds the learning rates for normal children in order to catch up. Fifteen behavioral objectives defined the specific performance criteria for the children to meet. The curriculum focused directly on these objectives ensuring that the child received an amount of exposure, practice, and correction sufficient to t ach what was intended. Direct instruction, similar to that used in regular school, was employed as an alternative to the informal style of the traditional nursery.

The experimental children were 4 and 5 year olds, predominantly Negro, and of low socio-economic status. Their parents were usually unskilled or semi skilled laborers; at least 30 to 40 percent were receiving some welfare assistance.

The program began in the fall of 1964 and data were collected through the spring of 1968. Each of three groups of approximately 15-20 children received the treatment for 2 years prior to their entrance into the first grade. The first group, Study I, participated in the preschool during academic years 1964-66; they completed the second grade in June 1968. The two subsequent groups, Studies II and III, were in the program from 1965-67 and 1966-68, respectively. The most recent data were collected from a follow up study of groups I and II in the early elementary grades. Only Study II will be described here, since it was the only study for which there was both an experimental and comparison group.

The effectiveness of the program was indicated by the significant superiority of the experimentals over the controls in Stanford Binet IQ gains over the 2 year period of instruction. In addition, upon completion of the 2 year preschool program the experimentals tested considerably above first grade level in mathematics and language as measured by the Wide Range Achievement Tests.

Personnel

The following persons represented the permanent annual project staff:

A. Administrators. (Two full-time.)

They supervised the work of the teachers, organized the teaching and testing schedules, and prepared materials.

B. Teacher-experimenters (Four part-time; undergraduate students; extensive experience working with children.)

They were responsible for administering the treatment and the tests.

The project staff had access to the services of the following personnel: curriculum consultants, teacher interns, school nurse, psychologist, and a full-time secretary.

Methodology: General

The present study was based on the two assumptions that: 1) a child who achieves well on an intelligence test or a more specific test of academic achievement has been taught the skills that are being tested and 2) if children can learn at an above normal rate during 2 years of intense preschool instruction, their performance will not drop during the second year of instruction as is commonly the case in traditional nurseries.

The subjects of the experiment were children who met the following selection criteria [Bereiter and Engelmann, 1968]:

1. According to Warner ratings of occupations (1949) and housing ratings obtained through the City Planning Commissioner's office, subjects were from low socio-economic homes (mean weighted S.E.S. in the low 40's).

2. Subjects were 4 years old by December 1, in keeping with public school's entrance policies.

3. Subjects did not have previous preschool experience.

4. Children with gross physical handicaps or severe retardation were excluded.

The children were initially identified through their siblings in the public schools. Four year old children were chosen for this intensive training because 1) children can and will absorb intellectual growth at this age and 2) if this growth is not provided at preschool or elementary age, the disadvantaged child will never gain on his advantaged contemporaries (Bereiter, 1967).

The children who qualified for the program according to the above criteria were administered the Stanford Binet tests and were divided into three groups - high intelligence, middle intelligence,

and low intelligence. They were then assigned to an experimental or comparison group with each group receiving the same proportion of highs, middles, and lows. Adjustments were made to balance the numbers of Negroes and whites, males and females in each group; Fifteen children were assigned to the experimental class and 28 to the comparison class.

The subjects in the comparison group receive 1 year of traditional preschool education and 1 year of public school kindergarten. During the first year, they attended a 2-hour-a-day preschool based as closely as possible on the recommendations of child development authorities. The emphasis of the program was on play, self expression, development of a positive self image through role playing, and typical nursery school activities. The pupil/teacher ratio was 5:1.

The experimental children were enrolled in the academic preschool for 2 years prior to their entering first grade. They received 2 hours of instruction daily. The pupil/teacher ratio was 5:1. The curriculum emphasis was on rapid attainment of basic academic concepts. The following set of objectives set forth the minimum level of expected performance to be attained by the students following 2 years of instruction. The success of the preschool program was judged by these standards of academic achievement.

Minimum Goals

1. To respond to both affirmative and <u>not</u> statements when asked "What is this?" "This is a book. This is not a book."

2. To respond to both affirmative and <u>not</u> statements when told "Tell me about this _____ [book, pencil, etc.]."

3. To use polar opposites ("If it is not _____, it must be _____") for four or more concept pairs, e.g., big-little, up-down, etc.

4. To use the following prepositions correctly in sentences: on, in, under, over, and between.

5. To name positives and negatives for at least four classes, e.g., "Tell me something that is a weapon." "A gun is a weapon." "A cow is not a weapon."

6. To perform simple if-then deductions. The child is presented a picture with large and small squares. All the large squares are red, but the small squares are of various other colors. "If the square is big, what do you know about it?" "It is red."

7. To use not in deductions. "If the square is little, then it is not red. What else do you know about it?" "It is blue or yellow".

8. To name all the basic colors.

9. To count to 20 without assistance and to 100, assistance at tens (30, 40, 50, etc.)

10. To count objects up to ten.

11. To recognize and name the vowels and at least 15 consonants.

12. To distinguish words from pictures.

13. To select rhyming words in jingles.

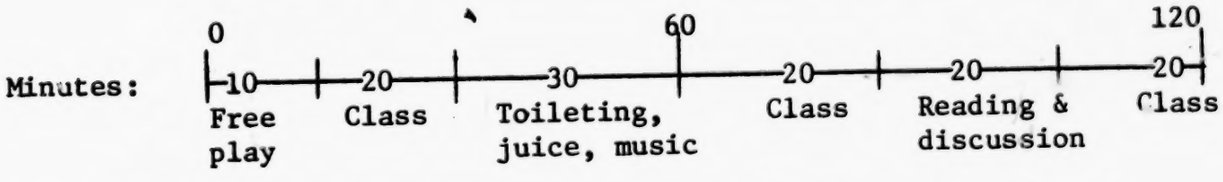
14. To possess a sight-reading vocabulary of four words or more, with evidence that the word on the flash cards has the same meaning for the child as corresponding spoken word.

Goals one to nine are associated with words and constructions that are spoken and could be learned in the course of informal conversation either at home or at school. Objectives 10-15 were associated with numerical and reading skills, achieved through special training.

Classes were conducted for 2 hours a day, 5 days a week. With occasional exceptions for field trips, the schedule in Diagram 1 was adhered to throughout the program, starting from the first day. Three homogeneous groups were formed from the experimental population, and each group had four to seven children. Three teachers - one each for language, arithmetic, and reading - participated. After an initial 10-minute period of free play, each group would go to a classroom for

Diagram 1

DAILY SCHEDULE FOR ACADEMIC PRESCHOOL PROGRAM



an instruction period of 20 minutes. Then all children would come back to a "homeroom" for 30 minutes of toileting, snacks, and singing.

After this each group would go to another 20-minute subject matter class. The children would then come back to the "homeroom" for a 20-minute period devoted to reading and discussion of stories and then they would separate for the final instruction period. All teachers participated in the "homeroom" activities. A fourth teacher worked with children whose performance was too low to permit their participation in the classroom activites.

The three regular groups were stratified according to level of performance, the initial grouping being made on the basis of Binet scores, but with frequent shifts being made as performance levels changed.

The classroom periods were presented as work sessions to the children, and they were encouraged not to play but to participate with the lessons as requested. This behavior was rewarded by verbal praise, and during the first month, by cookies. Children were reprimanded for deviations from the rules and, if this was not enough, were excluded from the instructional groups for short periods of time. Teachers kept the instruction session as lively and as enjoyable as possible and shifted the basis of motivation to the children's own accomplishments and progress as improvements became evident.

> Both the content and the style of teacher presentation used in the language, arithmetic, and reading sessions derived from a relatively simple principle: teach in the fastest, most economical manner possible. In language, the children were taught how to use a "minimum" instructional language. The language derived from the requirements of future teaching situations. In all teaching situations, the teacher would present physical objects of some kind and call the children's attention to some aspect of the objects -- perhaps the color, perhaps the relative size, perhaps the position in relation to another object. The teacher would also "test" the children, primarily by asking a child (or the group) a question. The basic language that is needed for all such instructional situations is one that adequately describes the object presented, that adequately calls attention to the conceptual dimension to which the teacher is directing the children, and that allows for "tests" or questions.
>
> The language that satisfies the requirement of the teaching situation consists of the two statement forms,
>
> This is a _____.

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This _____ is _____.

with plural and not variations (This is not a _____), with yes-no question (Is this a ball?) and with the what question (What is this?). The classroom instruction presumed nothing more of the child at the outset than that he be capable of initiating what was said to him [Bereiter and Engelmann, 1967].

A. Language Concept Class [Bereiter and Engelman, 1968]

The language teachers did not use a rich variety of expressions; rather, they confined themselves to the basic patterns noted above until the children had demonstrated through performance that they understood the statements and the relationship between statements and questions. Thus, the basic language of all instruction was taught.

Recognizing that learning the rules of language and logic is a matter of grasping and generalizing analogies, the program was structured so as to dramatize those analogies. Rather than grouping concepts on the basis of their thematic associations (concepts related to the school, to the zoo, etc.) they were grouped together on the basis of the rules governing their manipulation. Thus polar sets of diverse content (big-little, hot-cold, boy-girl were taught as part of a single sequence, so that the child eventually came to grasp the major principle governing such sets -- the principle that saying that something is not one member of the set is equivalent to saying that it is the other member of the set.

B. Arithmetic Class [Bereiter and Engelmann, 1968]

In arithmetic, the children were taught how to count objects and events (Tell me how many times I clap). They were then shown how addition, subtraction, and multiplication reduce to counting operations. For example, the children were shown how to translate such problems as

$5 + 3 = b$

into the counting operation: start out with five; get three more ; and you end up with _____; we have to count them to find out.

All addition problems were reduced to this operation. The children were taught some rote facts, such as the series

1 + 1 = 2
2 + 1 = 3
3 + 1 = 4
Etc.

since this series articulates the relationship between counting and adding; however, there was no attempt to teach the children an exhaustive set of arithmetic facts. Rather, the emphasis was on the operations that would lead to a correct solution.

The children were introduced to algebra and story problems early. To work algebra problems, the children used a variation of the translation they were taught for handling regular problems. For example, the operation for handling the problem

5 + b = 8

was: start out with five; get more: we don't know how many more, but we know we end up with 8. By starting out with five and getting more until he ends up with eight, the child discovers how many more he has to get.

The initial story problems were quite similar to the statement operations taught in connection with each type of problem. For example: a man starts out with five balls; then he gets more; he gets three more; how many does he end up with? The problem translates directly into the arithmetic statement:

5 + 3 = b

Problems were then systematically de-structured. That is, synonymous expressions were systematically introduced. After the children had learned to handle the basic story problems, the children were introduced to problems in which a man <u>has</u> so many balls, in which he

finds so many balls, in which he makes so many balls.

C. Reading Class [Bereiter and Engelmann, 1968]

The children were taught to read according to a modified ITA approach. The rules for decoding printed characters into spoken words were taught rather than comprehension skills for which the language program provided adequate preparation. The innovations which were introduced into the experimental program (primarily with the low performing children) had to do with the formation of long-vowel sounds and the convention for blending words. The following symbols were introduced to designate long-vowel sounds: ā, ē, ī, ō. The rationale for these symbols was that they could be introduced to help the child "spell" or sound out a variety of long-vowel words; after the children learned these words (sō, gō, nō, hē, shē, mē, save, fīne, etc.), the diacritical mark could then be dropped without grossly changing the total configuration of the word.

To help the children learn how to blend words, a skill which many disadvantaged fail to master after years of reading instruction, only continuous-sound words (fan, not ban or tan) were introduced initially. The children were taught how to proceed from letter to letter without pausing. In sounding-out words in this manner, the children were actually saying the words slowly and could see the relationship between the slowly produced word and the word as it is normally produced. To assure adequate performance in blending, the children were given say-it-fast drills with spoken words. "Say it fast and I'll show you the picture: te-le-phone."

By introducing certain artificial restrictions, we were able to reduce the inconsistency and complexity of English orthography and highlight its logical aspects. We restricted the initial vocabulary to three-letter consonant-vowel-consonant patterns, and avoided use of some of the more troublesome consonants. For further simplification we used only lower case letters.

Learning to apply the rules required, learning the implied visual discriminations ("look the same")

and auditory discriminations ("sound the same"). Learning this set of rules and learning the conventional sound values of the alphabet was taken to constitute the readiness phase of reading instruction, after which the program proceeded with a rather conventional phonic approach, using spelling patterns that followed the order of Bloomfield and Barnhardt's Let's Read (1961).

As early as possible, the children were introduced to controlled-vocabulary stories written by the reading staff. After reading them, the children took them home. Taking stories home functioned as an incentive.

In each of the three study areas, the teachers proceeded as quickly as possible, but only after the children had demonstrated through performance that they had mastered the skills that they would be expected to use on higher-level tasks.

The above description of the curriculum is a very general sketch. In each of these major subject areas, there were many sub-tasks. To teach each of the sub-tasks, the teacher had to take a number of steps. For example, to teach the children to blend words that are presented orally (a sub-task reading), the teacher first presented two-part words, each part of which is a word -- ice-cream, motor-boat, snow-man. Next, the teacher introduced relatively long words the parts of which were not "words," sit-ting, shov-el, mon-ey, etc. Next, the teacher broke the words that had been presented into more than one part -- mo-tor-boat, snow-ma-n, sh-ov-el. The teacher then introduced shorter words, broken into two parts: si-t, bea-t, c-ream, m-an. Finally, the teacher introduced short words that were divided into individual phonemes -- m-a-n, s-i-t, sh-o-v-1. More detailed examples appear in the next section of this report.

The teacher had three primary roles in the experimental program [Bereiter and Engelmann, 1968]:

1. She maintained discipline;
2. She taught concepts;
3. She tested the children's knowledge of concepts

before either providing a remedy or proceeding to the next task.

The general rules that guided her behavior in all three areas were:

1. Teach as rapidly and economically as possible;
2. Don't assume that the children know anything unless they have demonstrated that they do;
3. Get as many correct responses and as few incorrect responses out of the children during the allotted time as possible;
4. Teach the behavior that is necessary for successful classroom performance as economically as possible.

The goal of the program was to induce learning at an above average rate, which meant that the procedures that induce learning at a normal rate were not adequate. The teacher did not have the luxury of first shaping behavior and then introducing academic content. She simultaneously introduced academic content and the rules of behavior associated with the content. The focus was always on the behavior related to the task, never on behavior in the abstract. The sanctions that were used were:

Negative:

Loss of food reinforcers (raisins, juice);

Additional work ("If you keep that up, you'll have to work when the other children are singing. You're here to work.");

Physical manipulation (tugging on an arm to secure attention, tapping leg, physically turning children around in seat, turning face toward presentation);

Scolding, usually in loud voice ("Cut that out! Sidney! Look here!");

Repetition of task ("Do it again...Again...Again... Again. Now, after this when I tell you to do it, you do it.");

Positive:

The use of reinforcing objects in presentations ("Look what's on the snail's tail.");

The use of novel teacher reaction to objects ("Look at that silly number. That's 7. I can't stand a 7. have to erase it. Oh, there's another 7. I can't stand a 7...");

The use of personalization ("Here's a story about, guess who! Sidney!);

The use of praise ("Wow, did you hear Sidney? He's a smart boy. Let's clap for him. He is smart and he's working hard.");

Dramatic change of pace (After having the children yell out a series of statements in unison, the teacher stops. The room is dead silent. The children look at each other and smile. Then they laugh. The teacher interrupts in a loud voice, "Okay, let's hear it: four plus zero equals four.");

A dynamic presentation of objects (During a two-minute segment, the teacher may present as many as 30 objects -- some repeated -- and as many questions. "Tell me about this...what about this...And this... And this...");

Positive speculations ("Boy, will your mother ever be surprised when she finds out that you can read. She'll say, 'I never knew you were so smart.' That's what she'll say.");

Exercises with a reinforcing pay-off (Everybody likes to erase numbers, right? So I'll point to and and you can erase it.");

Relating positive comments of others -- both real and fictitious ("Do you know what the man who watched you read said to me? He said, 'These are the smartest kids I've ever seen in my life.' And you want to know something? He's right.");

In addition to the reinforcing aspects of the presentation, however, the teacher followed a basic

rule in presenting any new concept: The presentation must be consistent with one and only one concept. When the teacher presented the concept big, for example, she used the same statement forms, "This _____ is big," and "This _____ is not big," to describe a variety of object pairs -- cups, circles, figures, men. Each of the objects in the pair was identical except for size. Through this type of presentation, the teacher demonstrated the type of statements that are used to describe the invariant. "This cup is big; this ball is big; this man is big..."

Because of the presentational requirements necessary to demonstrate a concept, the teacher presented a great many examples, usually 10-15 times more than are used by the average classroom teacher (a judgment based on the requirements set forth in instructional materials designed for children in the early primary grades).

The teacher tested the children on various levels of performance. The first test of a concept was whether the children could find (or point to) the appropriate example. "Find the man that is big."

The next test was whether the children could answer yes-no questions about an object the teacher pointed to. "Is this ball big?...Is this ball big?"

The next test was whether the children could answer what questions. These are more difficult than yes-no questions because the children must supply the content word. "This ball is what?...Yes, this ball is big."

The teacher usually introduced the various tests rapid fire, in no particular order. However, if the children had difficulty with a what question or a yes-no question, the teacher retreated to a finding task and then paired the task with the yes-no and what questions. "Sidney, find the ball that is big...Good. This ball is big. Is this ball big?...Yes, this ball is big. This ball is what?...Yes, this ball is big."

While the rate at which questions are presented to the group and to individuals in the group varied with the tasks, the teacher often introduced as many as 20 questions a minute. She used the children's responses

to these questions as indications of whether or not they had learned the concepts she was presenting. She geared her presentation to the lowest performer in the group, because the goal of instruction was to teach every child each critical skill. (If a child consistently lagged behind the others in the group, he was moved to a slower group in which his performance was more consistent with that of the other members.) [Bereiter and Engelmann, 1968]

The preschool floor plan consisted of one large home room with three adjacent "special subject" rooms and lavatory facilities. The homeroom contained tables, refrigerator, piano, and shelves with equipment and books. The three study rooms were carpeted, had acoustical tiled ceilings and were unadorned.

Toys were limited to form boards, jigsaw puzzles, books, drawing and tracing materials, Cuisenaire rods, a miniature house, barn, and set of farm animals. Motor toys, climbing equipment, and paints were not available.

The project staff either designed their own curriculum materials or made adaptations from publications currently on the open market.

Teacher orientation consisted of training in the strategies for teaching the language, reading and math classes, and for disciplining, plus preparation for the first day of school including a complete rehersal of how to begin and what to do. Inservice training was also provided.

Parents were not invited to participate directly in the program; however, their interest and enthusiasm was maintained through parent meetings and home contacts made by college students who participated in the program as teacher interns.

Methodology: Specific

A. Language Class

The following is an example of the structure of a language lesson. (Bereiter, 1967).

1. Verbatim repetition:

Teacher: This block is red. Say it ...
Children: This block is red.

2. Yes-no questions:

Teacher: Is this block red?
Children: No, this block is not red.

3. Location tasks:

Teacher: Show me a block that is red.
Children: This block is red.

4. Statement production:

Teacher: Tell me about this piece of chalk.
Children: This piece of chalk is red.
Teacher: Tell me about what this piece of chalk is not.
Children: (ad lib) This piece of chalk is not green... not blue, etc.

5. Deduction problems:

Teacher: (with piece of chalk hidden in hand) This piece of chalk is not red. Do you know what color it is?
Children: No. Maybe it blue...Maybe it yellow...

These moves represent a rough hierarchy of task difficulty. In early stages of the program, large amounts of time have to be devoted to the lowest level -- verbatim repetition -- and deduction problems can seldom be handled. By the end of the program, most of the time is devoted to deductive problems, although at each new step in the program it is necessary to go through all of the moves, if only in very condensed form.

B. Arithmetic

During the first week the children learned the symbols for the numbers 0-20 and the signs +, -, and =. They were taught that a number symbol is a form (shared by many particular things) and not a particular thing itself. After the children were proficient at determining whether numerals were the same as or different from model numerals, they were presented with the numerals completely out of context. Counting order was taught next and finally the mathematical identity statement form was introduced (e.g., 1 + 0 = 1). The children could then be asked specific questions about these mathematical statements (e.g., one plus what numeral equals one). This was the beginning of the problem solving stage.

Examples of other problems used were:

1. if 1 + 0 = 1
   2 + 0 = ?
   3 + 0 = ?
   4 + 0 = ?

2. if 1 + 1 = 2
   2 + 1 = ?
   3 + 1 = ?

3. if 1 + 1 = 2
   2 + 2 = ?
   3 + 3 = ?

4. if 2 + A = 2 A = 0
   2 + B = 3 B = ?
   2 + C = 4 C = ?

5. if 1 - 1 = 0
   2 - 1 = ?
   3 - 1 = ?

6. Multiplication statements

3	X	1	=	3
count by threes		one time	end up with	three

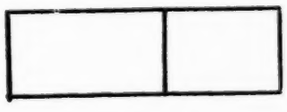
7. Count by multiples of a number

   1, 2, 3, 4, 5
   3, 6, 9, 12, 15

8. if 7 X 2 = 14
   7 X 3 = ?
   7 X A = 28

9. Word problems were introduced last. First children were shown diagrams and asked to say and write statements and equations describing the diagram. Then they were given statements and asked to solve problems:

<u>first</u>



Two balls plus one ball equals three balls.

2 + 1 = 3

then

If you have two balls and someone gives you one more, how many do you have?

C. Reading Class

The reading program attempted to teach the children how to systematically crack the reading code. A hierarchy of tasks was presented to teach the mechanics of reading. This hierarchy is described below:

Reading Hierarchy

1. Symbol-Action Games were used to teach the children left to right orientation in reading. Words were described as being made up of sounds; the first sound was represented by the left side of the word, each succeeding sound was positioned after the first sound. The teacher drew symbols on the blackboard in a line and placed an arrow (——) under the symbols. The children and teacher would then do what the symbols suggested (e.g., hand clapping) by reading them from left to right. Eventually the arrow was placed under a word to remind the children to read from left to right. The variety and sequence of symbols used in the games were frequently changed, just as the variety and sequence of letters in a word could be changed.

2. Sounds of letters were taught rather than names. Initially, the children were taught only one sound for each letter. After the children learned the ideal rules for reading, exceptions were introduced. All sounds were initially symbolized by lower case letters. Only a few sounds were introduced before the children began reading. These were: m, a, s, ē, f, d, r, c, i and th. The children practiced drawing and recognizing the letter symbols for these sounds.

3. Blending of two or more succeeding sounds was taught next. Real and artificial combinations of letters were used (e.g., fffffaaaa-mmmm). The children would practice saying these blends slowly and then fast.

4. Rhyming of sounds and eventually words was used to demonstrate the relationship between the parts in a word in both appearance

and sound. The rhyming lessons began with long words having large parts which carry over from word to word (e.g., supperman, zupperman). Latter rhymes between three and two letter words were introduced (e.g., sit, fit, me, he).

Combinations of these four steps were used during a 20-minute reading lesson. The children were frequently given letters and words to take home to show their parents and to use for practice.

Flash cards of words and pictures were used interchangeably to show that both are symbols of things that can be named (e.g., the printed word train and a picture of a train both stood for the verbalization "train").

Activities such as music and math were also used to reinforce concepts taught in language and reading. The names of the letters of the alphabet were taught in a song. The number of times one specific letter appeared in a word was counted (e.g., foot has two O's).

Evaluation

A. Measure of Achievement

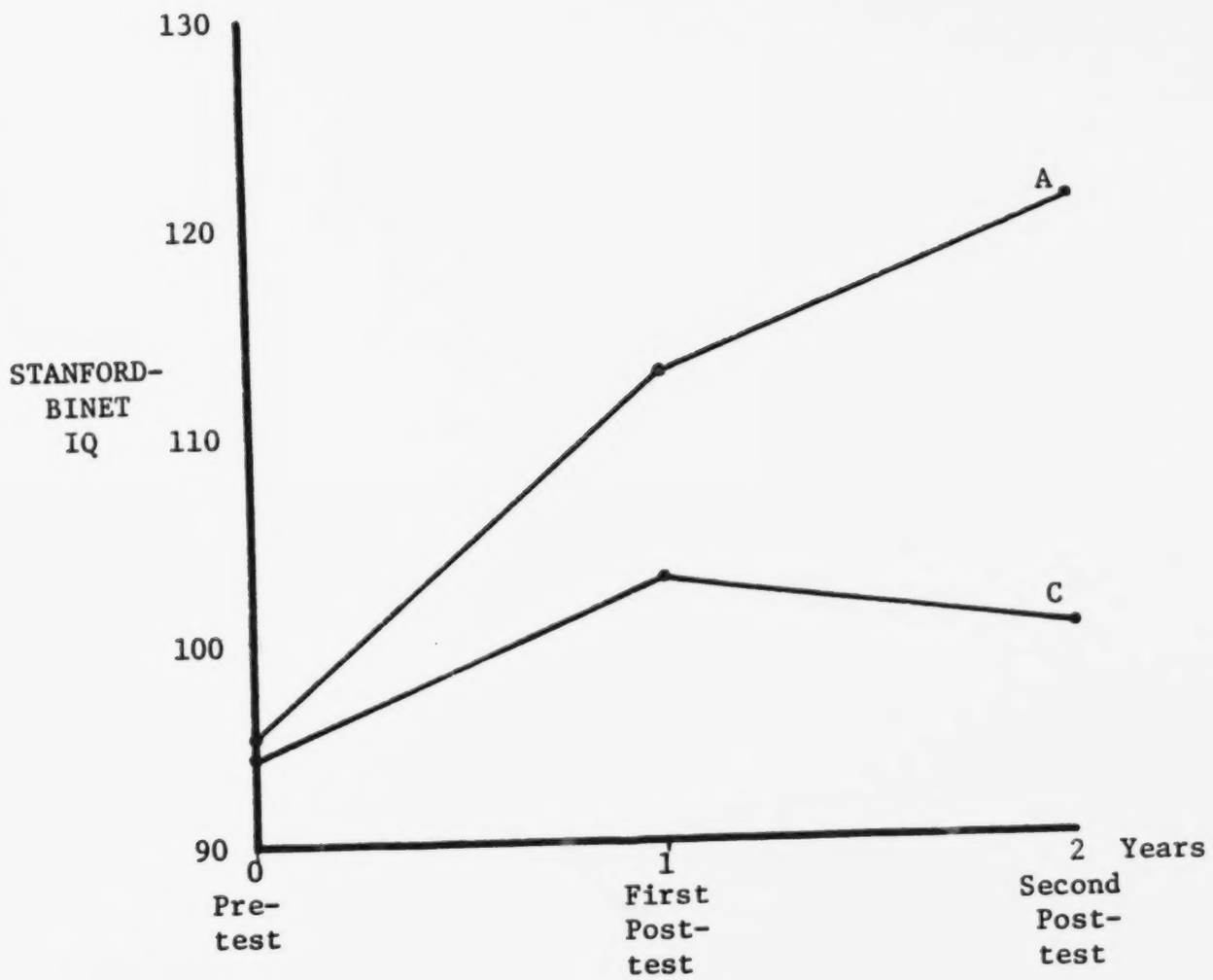
The Stanford Binet Intelligence Test and Wide Range Achievement Tests in reading, arithmetic, and spelling were administered during the course of the 2 year program. Both the experimental and control groups received the Binet IQ test three times -- once in the fall of 1965, again in the spring of 1966, and finally in the spring of 1967. The experimental group also received the Wide Range Achievement Test Battery in the spring of 1967 -- this was prior to their entrance into the first grade of public school.

The experimental group achieved significantly greater Stanford-Binet IQ gains than the subjects in the comparison program, both at the end of the first and second years of instruction. Diagram 2 illustrates the mean gains made by each group over the 2 year period. The comparison group showed an 8.07 gain after the first year of instruction, but had a loss of 2.96 points after the second year. The experimental showed a 17.14 gain after the first year and an 8.61 gain after the second year ($p=.02$ for Year 1, .001 for Year 2).

Table 1 shows the achievement performance of the 12 experimental students who completed the 2 years of the experimental program. The

Diagram 2

STANFORD-BINET IQ SCORES FOR EXPERIMENTAL AND CONTROL GROUPS IN THE ACADEMIC PRESCHOOL PROGRAM, 1965-67



A Experimental group

C Control group

mean reading achievement was grade level 2.60 with a range of 1.6 - 3.7. The mean arithmetic performance was 1.87 with a range of 1.4 - 3.3. The mean spelling performance was 1.87 with a range of 1.0 - 2.3.

Table 1

ACHIEVEMENT OF ACADEMIC PRESCHOOL AFTER 2 YEARS OF INSTRUCTION

		Grade Level on Wide-Range-Achievement Test		
Subject	I.Q.	Reading	Arithmetic	Spelling
MA	123	2.7	2.2	1.8
TA	103	1.6	2.3	1.7
TB	121	3.1	3.3	2.2
MB	131	3.7	3.1	2.1
RC	119	2.7	2.9	2.0
MC	112	3.6	2.5	2.3
BG	139	3.1	3.3	2.1
BP	112	1.6	1.4	1.0
SV	108	2.0	2.2	1.7
RV	138	3.1	2.7	2.0
DD	129	1.7	2.2	1.9
DW	118	2.3	2.0	1.6
	121.08	2.60	2.51	1.87

[Adapted from Table 4 of Appendix, Bereiter and Engelmann, 1968]

B. Other Evaluation Indices

It was difficult to evaluate the effects of the program on the personalities of the children; however, interviews with the parents and observations of the children disclosed no ill effects as a result of the highly structured formal instruction. There were few behavioral problems beyond the second week. Parents noted no regressive behavior

such as bed wetting, thumb sucking,or nightmares.

According to the investigators, the most noticeable characteristic of the children after 2 years of instruction was their confidence in their abilities to meet a challenge.

C. Modification and Suggestions

The best single reference to date which recommends how to organize and implement a similar program is the book, Teaching Disadvantaged Children in the Preschool (1966).

Budget

The annual replication cost of the program for some 15 disadvantaged pupils cannot be estimated as the personnel were employed in various other research and development activities. The experimental materials were also being used with a group of students from a middle socio-economic class.

Sources Quoted

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Other Sources Not Quoted

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* The Office of Education is collecting this material for placement in the ERIC system. Items may be obtained either in microfiche or hard copy.

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